



2048-59331-E.ST25
SEQUENCE LISTING

<110> BINLEY, JAMES M
SCHUELKE, NORBERT
OLSON, WILLIAM C
MADDON, PAUL J
MOORE, JOHN P

<120> STABILIZED VIRAL ENVELOPE PROTEINS AND USES THEREOF

<130> 2048/59331-E

<140> 10/780,993

<141> 2004-02-18

<150> 60/141,168

<151> 1999-06-25

<150> 09/602,864

<151> 2000-06-23

<160> 17

<170> PatentIn version 3.2

<210> 1

<211> 39

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 1

Gly Gly Gly Asp Met Arg Asp Asn Trp Arg Ser Glu Leu Tyr Lys Tyr
1 5 10 15

Lys Val Val Lys Ile Glu Pro Leu Gly Val Ala Pro Thr Lys Ala Lys
20 25 30

Arg Arg Val Val Gln Arg Glu
35

<210> 2

<211> 100

<212> PRT

<213> Human immunodeficiency virus type 1

<400> 2

Val Glu Lys Leu Trp Val Thr Val Tyr Tyr Gly Val Pro Val Trp Lys
1 5 10 15

Glu Ala Thr Thr Thr Leu Phe Cys Ala Ser Asp Ala Lys Ala Tyr Asp
20 25 30

Thr Glu Val His Asn Val Trp Ala Thr His Ala Cys Val Pro Thr Asp
35 40 45

2048-59331-E.ST25

Pro Asn Pro Gln Glu Val Val Leu Glu Asn Val Thr Glu His Phe Asn
50 55 60

Met Trp Lys Asn Asn Met Val Glu Gln Met Gln Glu Asp Ile Ile Ser
65 70 75 80

Leu Trp Asp Gln Ser Leu Lys Pro Cys Val Lys Leu Thr Pro Leu Cys
85 90 95

Val Thr Leu Asn
100

<210> 3
<211> 32
<212> DNA
<213> Artificial sequence

<220>
<223> primer directed to HIV-1

<400> 3
gtctattatg gggtagctga gaagctgtgg aa 32

<210> 4
<211> 36
<212> DNA
<213> ARTIFICIAL SEQUENCE

<220>
<223> PRIMER DIRECTED TO HIV-1

<400> 4
cgtagacgca gattcgaatt aataccacag ccagtt 36

<210> 5
<211> 60
<212> DNA
<213> ARTIFICIAL SEQUENCE

<220>
<223> PRIMER DIRECTED TO HIV-1

<400> 5
ctacgacttc gtctccgcct tcgactacgg ggaataggag ctgtgttcct tgggttcttg 60

<210> 6
<211> 60
<212> DNA
<213> ARTIFICIAL SEQUENCE

<220>
<223> PRIMER DIRECTED TO HIV-1

<400> 6
tcgaaggcgg agacgaagtc gtagccgcag tgccttggtg ggtgctactc ctaatggttc 60

<210> 7
 <211> 32
 <212> DNA
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> PRIMER DIRECTED TO HIV-1

<400> 7
 gtctattatg ggggtacctgt gtggaaagaa gc 32

<210> 8
 <211> 39
 <212> DNA
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> PRIMER DIRECTED TO ENVELOPE PROTEIN

<400> 8
 gtctgagtcg gatacctgtga cacctcagtc attacacag 39

<210> 9
 <211> 60
 <212> DNA
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> PRIMER DIRECTED TO ENVELOPE PROTEIN

<400> 9
 ctcgagtcctt cgaattagtg atgggtgatg gtgatgatac cacagccatt ttgttatgtc 60

<210> 10
 <211> 87
 <212> DNA
 <213> ARTIFICIAL SEQUENCE

<220>
 <223> PRIMER DIRECTED TO ENVELOPE PROTEIN

<400> 10
 ggctcaaagg atatcttttg acaggcctgt gtaatgactg aggtgtcaca tcctgcacca 60
 cagagtgggg ttaattttac acatggc 87

<210> 11
 <211> 15
 <212> PRT
 <213> Human immunodeficiency virus type 1

<400> 11
 Ala Pro Thr Lys Ala Lys Arg Arg Val Val Gln Arg Glu Lys Arg
 1 5 10 15

<210> 12

<211> 1929
 <212> DNA
 <213> Human immunodeficiency virus type 1

<400> 12
 gtagaaaagt tgtgggtcac agtctattat ggggtacctg tgtggaaaga agcaaccacc 60
 actctatttt gtgcatcaga tgctaaagca tatgatacag aggtacataa tgtttgggcc 120
 acacatgcct gtgtaccac agacccaac ccacaagaag tagtattgga aaatgtaaca 180
 gaacatttta acatgtggaa aaataacatg gtagaacaga tgcaggagga tataatcagt 240
 ttatgggatc aaagcctaaa gccatgtgta aaattaaccc cactctgtgt tactttaaat 300
 tgcaaggatg tgaatgctac taataccact aatgatagcg agggaacgat ggagagagga 360
 gaaataaaaa actgctcttt caatatcacc acaagcataa gagatgaggt gcagaaagaa 420
 tatgctcttt ttataaaact tgatgtagta ccaatagata ataataatac cagctatagg 480
 ttgataagtt gtgacacctc agtcattaca caggcctgtc caaagatatc ctttgagcca 540
 attcccatc attattgtgc cccggctggg tttgcgattc taaagtgtaa tgataagacg 600
 ttcaatggaa aaggaccatg taaaaatgtc agcacagtac aatgtacaca tggaattagg 660
 ccagtagtat caactcaact gctgctaaat ggcagtctag cagaagaaga ggtagtaatt 720
 agatctgaca atttcacgaa caatgctaaa accataatag tacagctgaa agaactctga 780
 gaaattaatt gtacaagacc caacaacaat acaagaaaaa gtatacatat aggaccaggg 840
 agagcatttt atactacagg agaaataata ggagatataa gacaagcaca ttgtaacatt 900
 agtagagcaa aatggaatga cactttaaaa cagatagtta taaaattaag agaacaattt 960
 gagaataaaa caatagtctt taatcactcc tcaggagggg acccagaaat tgtaatgcac 1020
 agttttaatt gtgaaggaga atttttctac tgtaattcaa cacaactgtt taatagtact 1080
 tggaataata atactgaagg gtcaaataac actgaaggaa atactatcac actcccatgc 1140
 agaataaaac aaattataaa catgtggcag gaagtaggaa aagcaatgta tgcccctccc 1200
 atcagaggac aaattagatg ttcacaaat attacagggc tgctattaac aagagatggg 1260
 ggtattaatg agaatgggac cgagatcttc agacctggag gaggagatat gagggacaat 1320
 tggagaagtg aattctataa atataaagta gtaaaaattg aaccattagg agtagcacc 1380
 accaagtgca agagaagagt ggtgcaaaga gaaaaaagag cagtgggaat aggagctgtg 1440
 ttccttgggt tcttgggagc agcaggaagc actatgggcg cagcgtcaat gacactgacg 1500
 gtacaggcca gactattatt gtctgggtata gtgcaacagc agaacaattt gctgagggct 1560
 attgaggcgc aacagcgtat gttgcaactc acagtctggg gcatcaagca gctccaggca 1620
 agagtcctgg ctgtggaaag atacctaggg gatcaacagc tcctggggat ttgggggtgc 1680
 tctggaaaac tcatttgctg cactgctgtg ccttggaatg ctagttggag taataaatct 1740

2048-59331-E.ST25

ctagatagga tttggaataa catgacctgg atggagtggg aaagagaaat tgacaattac 1800
 acaagcgaaa tatacacact aattgaagaa tcgcagaacc aacaagaaaa gaatgaacaa 1860
 gaattattgg aattagataa atgggcaagt ttgtggaatt ggtttgacat aacaaactgg 1920
 ctgtggtat 1929

<210> 13
 <211> 643
 <212> PRT
 <213> Human immunodeficiency virus type 1

<400> 13

Val Glu Lys Leu Trp Val Thr Val Tyr Tyr Gly Val Pro Val Trp Lys
 1 5 10 15

Glu Ala Thr Thr Thr Leu Phe Cys Ala Ser Asp Ala Lys Ala Tyr Asp
 20 25 30

Thr Glu Val His Asn Val Trp Ala Thr His Ala Cys Val Pro Thr Asp
 35 40 45

Pro Asn Pro Gln Glu Val Val Leu Glu Asn Val Thr Glu His Phe Asn
 50 55 60

Met Trp Lys Asn Asn Met Val Glu Gln Met Gln Glu Asp Ile Ile Ser
 65 70 75 80

Leu Trp Asp Gln Ser Leu Lys Pro Cys Val Lys Leu Thr Pro Leu Cys
 85 90 95

Val Thr Leu Asn Cys Lys Asp Val Asn Ala Thr Asn Thr Thr Asn Asp
 100 105 110

Ser Glu Gly Thr Met Glu Arg Gly Glu Ile Lys Asn Cys Ser Phe Asn
 115 120 125

Ile Thr Thr Ser Ile Arg Asp Glu Val Gln Lys Glu Tyr Ala Leu Phe
 130 135 140

Tyr Lys Leu Asp Val Val Pro Ile Asp Asn Asn Asn Thr Ser Tyr Arg
 145 150 155 160

Leu Ile Ser Cys Asp Thr Ser Val Ile Thr Gln Ala Cys Pro Lys Ile
 165 170 175

Ser Phe Glu Pro Ile Pro Ile His Tyr Cys Ala Pro Ala Gly Phe Ala
 180 185 190

2048-59331-E.ST25

Ile Leu Lys Cys Asn Asp Lys Thr Phe Asn Gly Lys Gly Pro Cys Lys
195 200 205

Asn Val Ser Thr Val Gln Cys Thr His Gly Ile Arg Pro Val Val Ser
210 215 220

Thr Gln Leu Leu Leu Asn Gly Ser Leu Ala Glu Glu Glu Val Val Ile
225 230 235 240

Arg Ser Asp Asn Phe Thr Asn Asn Ala Lys Thr Ile Ile Val Gln Leu
245 250 255

Lys Glu Ser Val Glu Ile Asn Cys Thr Arg Pro Asn Asn Asn Thr Arg
260 265 270

Lys Ser Ile His Ile Gly Pro Gly Arg Ala Phe Tyr Thr Thr Gly Glu
275 280 285

Ile Ile Gly Asp Ile Arg Gln Ala His Cys Asn Ile Ser Arg Ala Lys
290 295 300

Trp Asn Asp Thr Leu Lys Gln Ile Val Ile Lys Leu Arg Glu Gln Phe
305 310 315 320

Glu Asn Lys Thr Ile Val Phe Asn His Ser Ser Gly Gly Asp Pro Glu
325 330 335

Ile Val Met His Ser Phe Asn Cys Glu Gly Glu Phe Phe Tyr Cys Asn
340 345 350

Ser Thr Gln Leu Phe Asn Ser Thr Trp Asn Asn Asn Thr Glu Gly Ser
355 360 365

Asn Asn Thr Glu Gly Asn Thr Ile Thr Leu Pro Cys Arg Ile Lys Gln
370 375 380

Ile Ile Asn Met Trp Gln Glu Val Gly Lys Ala Met Tyr Ala Pro Pro
385 390 395 400

Ile Arg Gly Gln Ile Arg Cys Ser Ser Asn Ile Thr Gly Leu Leu Leu
405 410 415

Thr Arg Asp Gly Gly Ile Asn Glu Asn Gly Thr Glu Ile Phe Arg Pro
420 425 430

Gly Gly Gly Asp Met Arg Asp Asn Trp Arg Ser Glu Phe Tyr Lys Tyr
435 440 445

Lys Val Val Lys Ile Glu Pro Leu Gly Val Ala Pro Thr Lys Cys Lys
 450 455 460

Arg Arg Val Val Gln Arg Glu Lys Arg Ala Val Gly Ile Gly Ala Val
 465 470 475 480

Phe Leu Gly Phe Leu Gly Ala Ala Gly Ser Thr Met Gly Ala Ala Ser
 485 490 495

Met Thr Leu Thr Val Gln Ala Arg Leu Leu Leu Ser Gly Ile Val Gln
 500 505 510

Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln Arg Met Leu
 515 520 525

Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Val Leu Ala
 530 535 540

Val Glu Arg Tyr Leu Gly Asp Gln Gln Leu Leu Gly Ile Trp Gly Cys
 545 550 555 560

Ser Gly Lys Leu Ile Cys Cys Thr Ala Val Pro Trp Asn Ala Ser Trp
 565 570 575

Ser Asn Lys Ser Leu Asp Arg Ile Trp Asn Asn Met Thr Trp Met Glu
 580 585 590

Trp Glu Arg Glu Ile Asp Asn Tyr Thr Ser Glu Ile Tyr Thr Leu Ile
 595 600 605

Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Glu Leu Leu Glu
 610 615 620

Leu Asp Lys Trp Ala Ser Leu Trp Asn Trp Phe Asp Ile Thr Asn Trp
 625 630 635 640

Leu Trp Tyr

<210> 14
 <211> 1738
 <212> DNA
 <213> Human immunodeficiency virus type 1

<400> 14
 agtagaaaag ttgtgggtca cagtctatta tgggggtacct gtgtggaaag aagcaaccac 60
 cactctatatt tgtgcatcag atgctaaagc atatgataca gaggtacata atgtttgggc 120
 Page 7

2048-59331-E.ST25

cacacatgcc	tgtgtaccca	cagaccccaa	cccacaagaa	gtagtattgg	aaaatgtaac	180
agaacatttt	aacatgtgga	aaaataacat	ggtagaacag	atgcaggagg	atataatcag	240
tttatgggat	caaagcctaa	agccatgtgt	aaaattaacc	ccactctgtg	gtgcaggatg	300
tgacacctca	gtcattacac	aggcctgtcc	aaagatatcc	tttgagccaa	ttcccataca	360
ttattgtgcc	ccggctggtt	ttgcgattct	aaagtgtaat	gataagacgt	tcaatggaaa	420
aggaccatgt	aaaaatgtca	gcacagtaca	atgtacacat	ggaattaggc	cagtagtattc	480
aactcaactg	ctgctaaatg	gcagtctagc	agaagaagag	gtagtaatta	gatctgacaa	540
tttcacgaac	aatgctaaaa	ccataatagt	acagctgaaa	gaatctgtag	aaattaattg	600
tacaagaccc	aacaacaata	caagaaaaag	tatacatata	ggaccaggga	gagcatttta	660
tactacagga	gaaataatag	gagatataag	acaagcacat	tgtaacatta	gtagagcaaa	720
atggaatgac	actttaaaac	agatagttat	aaaattaaga	gaacaatttg	agaataaaaac	780
aatagtcttt	aatcactcct	caggagggga	cccagaaatt	gtaatgcaca	gttttaattg	840
tggaggagaa	tttttctact	gtaattcaac	acaactgttt	aatagtactt	ggaataataa	900
tactgaaggg	tcaaataaca	ctgaaggaaa	tactatcaca	ctcccatgca	gaataaaaaca	960
aattataaac	atgtggcagg	aagtaggaaa	agcaatgtat	gcccctccca	tcagaggaca	1020
aattagatgt	tcatcaaata	ttacagggct	gctattaaca	agagatggtg	gtattaatga	1080
gaatgggacc	gagatcttca	gacctggagg	aggagatatg	agggacaatt	ggagaagtga	1140
attatataaa	tataaagtag	taaaaattga	accattagga	gtagcaccca	ccaagtgcaa	1200
gagaagagtg	gtgcaaagag	aaaaaagagc	agtgggaata	ggagctgtgt	tccttggggt	1260
cttgggagca	gcaggaagca	ctatgggcgc	agcgtcaatg	acactgacgg	tacaggccag	1320
actattattg	tctggtatag	tgcaacagca	gaacaatttg	ctgagggcta	ttgaggcgca	1380
acagcgtatg	ttgcaactca	cagtctgggg	catcaagcag	ctccaggcaa	gagtcctggc	1440
tgtggaaaga	tacctagggg	atcaacagct	cctggggatt	tggggttgct	ctggaaaact	1500
catttgctgc	actgctgtgc	cttggaatgc	tagttggagt	aataaatctc	tggataggat	1560
ttggaataac	atgacctgga	tggagtggga	aagagaaatt	gacaattaca	caagcgaaat	1620
atacacccta	attgaagaat	cgcagaacca	acaagaaaag	aatgaacaag	aattattgga	1680
attagataaa	tgggcaagtt	tgtggaattg	gtttgacata	acaaactggc	tgtgggtat	1738

<210> 15
 <211> 579
 <212> PRT
 <213> Human immunodeficiency virus type 1
 <400> 15

2048-59331-E.ST25

Val Glu Lys Leu Trp Val Thr Val Tyr Tyr Gly Val Pro Val Trp Lys
 1 5 10 15
 Glu Ala Thr Thr Thr Leu Phe Cys Ala Ser Asp Ala Lys Ala Tyr Asp
 20 25 30
 Thr Glu Val His Asn Val Trp Ala Thr His Ala Cys Val Pro Thr Asp
 35 40 45
 Pro Asn Pro Gln Glu Val Val Leu Glu Asn Val Thr Glu His Phe Asn
 50 55 60
 Met Trp Lys Asn Asn Met Val Glu Gln Met Gln Glu Asp Ile Ile Ser
 65 70 75 80
 Leu Trp Asp Gln Ser Leu Lys Pro Cys Val Lys Leu Thr Pro Leu Cys
 85 90 95
 Gly Ala Gly Cys Asp Thr Ser Val Ile Thr Gln Ala Cys Pro Lys Ile
 100 105 110
 Ser Phe Glu Pro Ile Pro Ile His Tyr Cys Ala Pro Ala Gly Phe Ala
 115 120 125
 Ile Leu Lys Cys Asn Asp Lys Thr Phe Asn Gly Lys Gly Pro Cys Lys
 130 135 140
 Asn Val Ser Thr Val Gln Cys Thr His Gly Ile Arg Pro Val Val Ser
 145 150 155 160
 Thr Gln Leu Leu Leu Asn Gly Ser Leu Ala Glu Glu Glu Val Val Ile
 165 170 175
 Arg Ser Asp Asn Phe Thr Asn Asn Ala Lys Thr Ile Ile Val Gln Leu
 180 185 190
 Lys Glu Ser Val Glu Ile Asn Cys Thr Arg Pro Asn Asn Asn Thr Arg
 195 200 205
 Lys Ser Ile His Ile Gly Pro Gly Arg Ala Phe Tyr Thr Thr Gly Glu
 210 215 220
 Ile Ile Gly Asp Ile Arg Gln Ala His Cys Asn Ile Ser Arg Ala Lys
 225 230 235 240
 Trp Asn Asp Thr Leu Lys Gln Ile Val Ile Lys Leu Arg Glu Gln Phe
 245 250 255

2048-59331-E.ST25

Glu Asn Lys Thr Ile Val Phe Asn His Ser Ser Gly Gly Asp Pro Glu
 260 265 270
 Ile Val Met His Ser Phe Asn Cys Gly Gly Glu Phe Phe Tyr Cys Asn
 275 280 285
 Ser Thr Gln Leu Phe Asn Ser Thr Trp Asn Asn Asn Thr Glu Gly Ser
 290 295 300
 Asn Asn Thr Glu Gly Asn Thr Ile Thr Leu Pro Cys Arg Ile Lys Gln
 305 310 315 320
 Ile Ile Asn Met Trp Gln Glu Val Gly Lys Ala Met Tyr Ala Pro Pro
 325 330 335
 Ile Arg Gly Gln Ile Arg Cys Ser Ser Asn Ile Thr Gly Leu Leu Leu
 340 345 350
 Thr Arg Asp Gly Gly Ile Asn Glu Asn Gly Thr Glu Ile Phe Arg Pro
 355 360 365
 Gly Gly Gly Asp Met Arg Asp Asn Trp Arg Ser Glu Leu Tyr Lys Tyr
 370 375 380
 Lys Val Val Lys Ile Glu Pro Leu Gly Val Ala Pro Thr Lys Cys Lys
 385 390 395 400
 Arg Arg Val Val Gln Arg Glu Lys Arg Ala Val Gly Ile Gly Ala Val
 405 410 415
 Phe Leu Gly Phe Leu Gly Ala Ala Gly Ser Thr Met Gly Ala Ala Ser
 420 425 430
 Met Thr Leu Thr Val Gln Ala Arg Leu Leu Leu Ser Gly Ile Val Gln
 435 440 445
 Gln Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln Arg Met Leu
 450 455 460
 Gln Leu Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Val Leu Ala
 465 470 475 480
 Val Glu Arg Tyr Leu Gly Asp Gln Gln Leu Leu Gly Ile Trp Gly Cys
 485 490 495
 Ser Gly Lys Leu Ile Cys Cys Thr Ala Val Pro Trp Asn Ala Ser Trp
 500 505 510

2048-59331-E.ST25

Ser Asn Lys Ser Leu Asp Arg Ile Trp Asn Asn Met Thr Trp Met Glu
515 520 525

Trp Glu Arg Glu Ile Asp Asn Tyr Thr Ser Glu Ile Tyr Thr Leu Ile
530 535 540

Glu Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Glu Leu Leu Glu
545 550 555 560

Leu Asp Lys Trp Ala Ser Leu Trp Asn Trp Phe Asp Ile Thr Asn Trp
565 570 575

Leu Trp Tyr

<210> 16
<211> 1875
<212> DNA
<213> Human immunodeficiency virus type 1

<220>
<221> misc_feature
<222> (453)..(453)
<223> n=unknown

<220>
<221> misc_feature
<222> (615)..(615)
<223> n=unknown

<220>
<221> misc_feature
<222> (639)..(639)
<223> n=unknown

<400> 16
gtagaaaagt tgtgggtcac agtctattat ggggtacctg tgtggaaaga agcaaccacc 60
actctatttt gtgcatcaga tgctaaagca tatgatacag aggtacataa tgtttgggcc 120
acacatgcct gtgtaccac agacccaac ccacaagaag tagtattgga aaatgtaaca 180
gaacatttta acatgtggaa aaataacatg gtagaacaga tgcaggagga tataatcagt 240
ttatgggatc aaagcctaaa gccatgtgta aaattaaccc cactctgtgt tactttaaat 300
tgcaaggatg tgaatgctac taataccact aatgatagcg agggaacgat ggagagagga 360
gaaataaaaa actgctcttt caatatcacc acaagcataa gagatgaggt gcagaaagaa 420
tatgctcttt ttataaaact tgatgtagta ccnatagata ataataatac cagctatagg 480
ttgataagtt gtgacacctc agtcattaca caggcctgtc caaagatatc ctttgagcca 540
attcccatatc attattgtgc cccggctggt tttgcgattc taaagtgtaa tgataagacg 600

2048-59331-E.ST25

```

ttcaatggaa aaggnccatg taaaaatgtc agcacagtnc aatgtacaca tggaattagg 660
ccagtagtat caactcaact gctgctaaat ggcagtctag cagaagaaga ggtagtaatt 720
agatctgaca atttcacgaa caatgctaaa accataatag tacagctgaa agaattctgta 780
gaaattaatt gtacaagacc caacaacaat ggagccggcg atataagaca agcacattgt 840
aacattagta gagcaaaatg gaatgacact ttaaaacaga tagttataaa attaagagaa 900
caatttgaga ataaaacaat agtctttaat cactcctcag gaggggaccc agaaattgta 960
atgcacagtt ttaattgtgg aggagaatth ttctactgta attcaacaca actgtttaat 1020
agtacttgga ataataatac tgaaggggtca aataacactg aaggaaatac tatcacactc 1080
ccatgcagaa taaaacaaat tataaacatg tggcaggaag taggaaaagc aatgtatgcc 1140
cctcccatca gaggacaaat tagatgttca tcaaatatta cagggctgct attaacaaga 1200
gatggtggta ttaatgagaa tgggaccgag atcttcagac ctggaggagg agatatgagg 1260
gacaattgga gaagtgaatt atataaatat aaagtagtaa aaattgaacc attaggagta 1320
gcacccacca agtgcaagag aagagtgggtg caaagagaaa aaagagcagt gggaatagga 1380
gctgtgttcc ttgggttctt gggagcagca ggaagcacta tgggcgcagc gtcaatgaca 1440
ctgacggtac aggccagact attattgtct ggtatagtgc aacagcagaa caatttgctg 1500
agggtatttg aggcgcaaca gcgtatgttg caactcacag tctggggcat caagcagctc 1560
caggcaagag tcctggctgt ggaaagatac ctaggggatc aacagctcct ggggatttgg 1620
ggttgctctg gaaaactcat ttgctgcact gctgtgcctt ggaatgctag ttggagtaat 1680
aaatctctgg ataggatttg gaataacatg acctggatgg agtgggaaag agaaattgac 1740
aattacacaa gcgaaatata caccctaatt gaagaatcgc agaaccaaca agaaaagaat 1800
gaacaagaat tattggaatt agataaatgg gcaagtttgt ggaattgggt tgacataaca 1860
aaatggctgt ggtat 1875

```

```

<210> 17
<211> 625
<212> PRT
<213> Human immunodeficiency virus type 1

```

```

<220>
<221> MISC_FEATURE
<222> (151)..(151)
<223> X=UNKNOWN AMINO ACID

```

```

<220>
<221> MISC_FEATURE
<222> (205)..(205)
<223> X=UNKNOWN AMINO ACID

```

```

<220>

```

<221> MISC_FEATURE
 <222> (213)..(213)
 <223> X=UNKNOWN AMINO ACID

<400> 17

Val Glu Lys Leu Trp Val Thr Val Tyr Tyr Gly Val Pro Val Trp Lys
 1 5 10 15

Glu Ala Thr Thr Thr Leu Phe Cys Ala Ser Asp Ala Lys Ala Tyr Asp
 20 25 30

Thr Glu Val His Asn Val Trp Ala Thr His Ala Cys Val Pro Thr Asp
 35 40 45

Pro Asn Pro Gln Glu Val Val Leu Glu Asn Val Thr Glu His Phe Asn
 50 55 60

Met Trp Lys Asn Asn Met Val Glu Gln Met Gln Glu Asp Ile Ile Ser
 65 70 75 80

Leu Trp Asp Gln Ser Leu Lys Pro Cys Val Lys Leu Thr Pro Leu Cys
 85 90 95

Val Thr Leu Asn Cys Lys Asp Val Asn Ala Thr Asn Thr Thr Asn Asp
 100 105 110

Ser Glu Gly Thr Met Glu Arg Gly Glu Ile Lys Asn Cys Ser Phe Asn
 115 120 125

Ile Thr Thr Ser Ile Arg Asp Glu Val Gln Lys Glu Tyr Ala Leu Phe
 130 135 140

Tyr Lys Leu Asp Val Val Xaa Ile Asp Asn Asn Asn Thr Ser Tyr Arg
 145 150 155 160

Leu Ile Ser Cys Asp Thr Ser Val Ile Thr Gln Ala Cys Pro Lys Ile
 165 170 175

Ser Phe Glu Pro Ile Pro Ile His Tyr Cys Ala Pro Ala Gly Phe Ala
 180 185 190

Ile Leu Lys Cys Asn Asp Lys Thr Phe Asn Gly Lys Xaa Pro Cys Lys
 195 200 205

Asn Val Ser Thr Xaa Gln Cys Thr His Gly Ile Arg Pro Val Val Ser
 210 215 220

Thr Gln Leu Leu Leu Asn Gly Ser Leu Ala Glu Glu Glu Val Val Ile
 Page 13

225 230 235 240
 Arg Ser Asp Asn Phe Thr Asn Asn Ala Lys Thr Ile Ile Val Gln Leu
 245 250 255
 Lys Glu Ser Val Glu Ile Asn Cys Thr Arg Pro Asn Asn Asn Gly Ala
 260 265 270
 Gly Asp Ile Arg Gln Ala His Cys Asn Ile Ser Arg Ala Lys Trp Asn
 275 280 285
 Asp Thr Leu Lys Gln Ile Val Ile Lys Leu Arg Glu Gln Phe Glu Asn
 290 295 300
 Lys Thr Ile Val Phe Asn His Ser Ser Gly Gly Asp Pro Glu Ile Val
 305 310 315 320
 Met His Ser Phe Asn Cys Gly Gly Glu Phe Phe Tyr Cys Asn Ser Thr
 325 330 335
 Gln Leu Phe Asn Ser Thr Trp Asn Asn Asn Thr Glu Gly Ser Asn Asn
 340 345 350
 Thr Glu Gly Asn Thr Ile Thr Leu Pro Cys Arg Ile Lys Gln Ile Ile
 355 360 365
 Asn Met Trp Gln Glu Val Gly Lys Ala Met Tyr Ala Pro Pro Ile Arg
 370 375 380
 Gly Gln Ile Arg Cys Ser Ser Asn Ile Thr Gly Leu Leu Leu Thr Arg
 385 390 395 400
 Asp Gly Gly Ile Asn Glu Asn Gly Thr Glu Ile Phe Arg Pro Gly Gly
 405 410 415
 Gly Asp Met Arg Asp Asn Trp Arg Ser Glu Leu Tyr Lys Tyr Lys Val
 420 425 430
 Val Lys Ile Glu Pro Leu Gly Val Ala Pro Thr Lys Cys Lys Arg Arg
 435 440 445
 Val Val Gln Arg Glu Lys Arg Ala Val Gly Ile Gly Ala Val Phe Leu
 450 455 460
 Gly Phe Leu Gly Ala Ala Gly Ser Thr Met Gly Ala Ala Ser Met Thr
 465 470 475 480

2048-59331-E.ST25

Leu Thr Val Gln Ala Arg Leu Leu Leu Ser Gly Ile Val Gln Gln Gln
 485 490 495

Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln Arg Met Leu Gln Leu
 500 505 510

Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Val Leu Ala Val Glu
 515 520 525

Arg Tyr Leu Gly Asp Gln Gln Leu Leu Gly Ile Trp Gly Cys Ser Gly
 530 535 540

Lys Leu Ile Cys Cys Thr Ala Val Pro Trp Asn Ala Ser Trp Ser Asn
 545 550 555 560

Lys Ser Leu Asp Arg Ile Trp Asn Asn Met Thr Trp Met Glu Trp Glu
 565 570 575

Arg Glu Ile Asp Asn Tyr Thr Ser Glu Ile Tyr Thr Leu Ile Glu Glu
 580 585 590

Ser Gln Asn Gln Gln Glu Lys Asn Glu Gln Glu Leu Leu Glu Leu Asp
 595 600 605

Lys Trp Ala Ser Leu Trp Asn Trp Phe Asp Ile Thr Lys Trp Leu Trp
 610 615 620

Tyr
 625